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derived: $\pi$ rel. $= + 0''.063 \mp 0''.012$. The available results are:

| | ″ | | ″ |
|---|---|---|---|
| Jewdokimow | +0.040 | ∓ | 0.038 |
| Flint | +0.020 | ∓ | 0.058 |
| Yale | +0.109 | ∓ | 0.014 |
| Groningen | +0.079 | ∓ | 0.029 |
| Groningen | —0.005 | ∓ | 0.020 |
| Yerkes | +0.047 | ∓ | 0.010 |
| McCormick | +0.035 | ∓ | 0.008 |
| Mt. Wilson Spect. | +0.096 | ∓ | 0.019 |
| Mt. Wilson Trig. | +0.063 | ∓ | 0.012 |

Reducing these values to absolute parallaxes and correcting them to the system described in *Mt. Wilson Contribution* No. 189, we find as the best value of the parallax: $\pi = + \mathbf{0''.062}$, giving an absolute magnitude of 0.0, and for the faint physical companion an absolute magnitude of + 12.5.

A. van Maanen.

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## Disappearance of Bright Lines From the Spectrum of H. D. 9105

H. D. 9105, R. A. 1900, $1^h24.6^m$; Dec. 1900, $+ 62°51'$;
Mag. 7.5; Spectrum B0P

This spectrum, which was discovered at the Harvard College Observatory to contain bright lines, appears to have undergone a decided change, as several photographs recently secured at the Mt. Wilson Observatory show only dark lines. A remark in the Henry Draper catalogue states, "The lines $H\beta$, $H\gamma$, and $H\delta$ are bright." Miss Cannon has kindly sent the following additional information:

"I have looked up this spectrum on nine photographs taken between 1891 and 1914. It appears to change in a manner similar to *η Centauri,* but owing to the small dispersion of the photographs which were all taken with the 8-inch telescope, a detailed study is difficult. The emission lines are not very strong at any time, but are certainly seen on several plates. Faint emission is seen at $H\beta$, $H\gamma$, and $H\delta$ on September 21, 1891, and September 9, 1913. On several plates, $H\beta$ is a narrow bright line and bright lines not due to hydrogen are present. Numerous dark lines not characteristic of Class B are seen, especially between $H\beta$ and $H\gamma$. I suspect that the star is a spectroscopic binary, for the spectrum seems to be composite and variable."

Our attention was first called to this spectrum by the failure of the bright H$\alpha$ line to appear on the objective prism plates with the 10-inch telescope. These plates usually show a well marked bright H$\alpha$ line in the Harvard "bright H$\beta$" stars. We secured several observations of the photographic region of the spectrum in 1920 and 1921 with slit spectrographs attached to the large reflectors. These agree in showing an absorption spectrum of Class B5.

Of the following observations, those marked 10-inch are of the H$\alpha$ region with an objective prism; the remainder are of the photographic region with one-prism slit spectrographs.

| Date | Instrument | Observer |
|---|---|---|
| 1920, Sept. 10 | 10-inch | M |
| " 12 | 10 " | M |
| " 18 | 10 " | H |
| " 26 | 100 " | M |
| Oct. 26 | 10 " | H |
| " 26 | 100 " | M |
| 1921, Feb. 25 | 100 " | M |
| Aug. 23 | 60 " | H |
| " 25 | 100 " | H |

The radial velocities as measured from the slit spectrograms apparently range from —29 km to —60 km. These results depend on four or five hydrogen, helium, and magnesium lines which, though narrow, are weak and do not always agree well. The measures may indicate a change in the radial velocity or in the structure of the lines.

It is interesting to note that within half a degree of this star lies another bright-line star of Class B, B. D. + 62°271, discovered by us in 1920[1].

PAUL W. MERRILL,
MILTON L. HUMASON.

Pasadena, California, April, 1922.

## THERMOCOUPLE OBSERVATIONS ON THE TOTAL RADIATION FROM VARIABLE STARS OF LONG PERIOD

The following list of variable stars of long period and late spectral class with several reference stars of earlier type was observed with the vacuum thermocouple and galvanometer attached to the 100-inch Hooker telescope on April 28, 1922. Confirmatory observations were secured on March 1 and April 29, but as conditions of transparency and seeing were uncertain

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[1] *Publ. A. S. P.,* **33,** 264, 1921.